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Test 1193: Massey-Ferguson MF 275 Diesel

Tractor Museum
University of Nebraska-Lincoln, TractorMuseumArchives@unl.edu

NEBRASKA TRACTOR TEST 1193 – MASSEY-FERGUSON MF 275 DIESEL

POWER TAKE-OFF PERFORMANCE

Hp	Crank-shaft speed rpm	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temperature Degrees F Cooling medium	Air wet bulb	Air dry bulb	Barometer inches of Mercury
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—642 rpm)								
67.43	2000	4.605	0.472	14.64	197	56	75	29.153
Standard Power Take-off Speed (540 rpm)—One Hour								
61.76	1683	4.355	0.487	14.18	207	56	75	29.150
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
59.96	2094	3.980	0.458	15.07	188	57	76	.....
0.00	2197	1.421	.....	.....	180	57	76	.....
30.82	2151	2.463	0.552	12.51	181	57	75	.....
67.53	2001	4.653	0.476	14.51	196	57	76	.....
15.58	2175	1.886	0.836	8.26	181	56	74	.....
45.64	2125	3.137	0.475	14.55	185	56	75	.....
Av 36.59	**2123**	**2.923**	**0.552**	**12.51**	**185**	**57**	**75**	**29.160**

DRAWBAR PERFORMANCE

Hp	Draw-bar pull lbs	Speed miles per hr	Crank-shaft speed rpm	Fuel Consumption Slip of drivers %	Fuel Consumption Gal per hr	Fuel Consumption Lb per hp-hr	Hp-hr per gal	Temp Degrees F Cool-ing med	Air wet bulb	Air dry bulb	Barometer inches of Mercury
VARYING DRAWBAR POWER AND FUEL CONSUMPTION WITH BALLAST											
Maximum Available Power—Two Hours 7th (1 H L) Gear											
59.73	4341	5.16	1999	6.25	4.580	0.529	13.04	190	49	59	29.295
75% of Pull at Maximum Power—Ten Hours 7th (1 H L) Gear											
48.00	3241	5.55	2112	4.48	3.631	0.522	13.22	185	52	62	28.965
50% of Pull at Maximum Power—Two Hours 7th (1 H L) Gear											
33.27	2186	5.71	2142	3.32	2.860	0.594	11.63	183	49	58	28.945
50% of Pull at Reduced Engine Speed—Two Hours 9th (2 H L) Gear											
33.57	2214	5.69	1454	3.25	2.281	0.469	14.72	182	54	65	28.905
MAXIMUM POWER WITH BALLAST											
45.80	7292	2.36	2107	12.79	4th Gear (2 L H)			183	47	51	28.940
56.38	6574	3.22	2000	11.10	5th Gear (3 L L)			190	50	62	29.300
57.74	4962	4.36	2001	7.20	6th Gear (3 L H)			191	50	62	29.300
60.16	4376	5.16	1997	6.28	7th Gear (1 H L)			190	50	60	29.300
59.14	3249	6.83	1999	4.67	8th Gear (1 H H)			191	50	62	29.300
59.68	2884	7.76	2001	4.05	9th Gear (2 H L)			188	50	62	29.300

VARYING DRAWBAR PULL AND TRAVEL SPEED WITH BALLAST
7th (1 H L) Gear

Pounds Pull	4317	4642	4832	4859	4779	4628
Horsepower	59.47	57.27	52.76	46.38	39.12	31.72
Crankshaft Speed rpm	2000	1802	1599	1400	1199	1001
Miles Per Hour	5.17	4.63	4.09	3.58	3.07	2.57
Slip of Drivers %	6.15	6.68	6.94	7.20	6.94	6.81

TRACTOR SOUND LEVEL WITHOUT CAB	dB(A)
Maximum Available Power 2 Hours	97.5
75% of Pull at Max. Power 10 Hours	98.5
50% of Pull at Max. Power 2 Hours	96.5
50% of Pull at Reduced Engine Speed 2 Hours	92.0
Bystander in 12th (3 H H) Gear	89.0

TIRES, BALLAST AND WEIGHT		With Ballast	Without Ballast
Rear Tires	—No., size, ply & psi	Two 15.5-38; 6; 20	Two 15.5-38; 6; 20
Ballast	—Liquid	685 lb each	None
	Cast Iron	600 lb each	None
Front Tires	—No., size, ply & psi	Two 7.5L-15; 6; 40	Two 7.5L-15; 6; 40
Ballast	—Liquid	None	None
	Cast Iron	75 lb each	None
Height of drawbar		19.5 inches	19.5 inches
Static weight with operator	—rear	7060 lb	4490 lb
	front	2270 lb	2120 lb
	total	9330 lb	6610 lb

Department of Agricultural Engineering

Dates of Test: October 24 to November 4, 1975

Manufacturer: MASSEY-FERGUSON INC., 1901 Bell Avenue, Des Moines, Iowa 50315

FUEL, OIL AND TIME **Fuel** Diesel No 2 **Cetane No** 51.7 (rating taken from oil company's typical inspection data) **Specific gravity converted to 60°/60°** 0.8293 **Weight per gallon** 6.905 lb **Oil SAE** 20-20W **API service classification** SB/SE-CA/CC **To motor** 2.683 gal **Drained from motor** 1.488 gal **Transmission and final drive lubricant** Massey-Ferguson Permatran Oil **Total time engine was operated** 53.5 hours.

ENGINE **Make** Perkins **Type** 4 cylinder **Serial No** 129 389L **Crankshaft Mounted** lengthwise **Rated rpm** 2000 **Bore and stroke** 3.975″ x 5″ **Compression ratio** 16 to 1 **Displacement** 248 cu in **Cranking system** 12 volt **Lubrication** pressure **Air cleaner** dry dual pleated paper element with dust evacuator **Oil filter** paper screw-on cartridge **Oil cooler** radiator for transmission and hydraulic oil **Fuel filter** paper element **Muffler** vertical **Cooling medium temperature control** thermostat.

CHASSIS **Type** standard **Serial No** 9A 224 351 **Tread width** rear 56″ to 90″ front 48″ to 80″ **Wheel base** 82″ **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 25.6″ Vertical distance above roadway 33.1″ Horizontal distance from center of rear wheel tread 0.19″ to the right **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with operator controlled power shift **Advertised speeds mph** first 1.3 second 1.7 third 2.0 fourth 2.6 fifth 3.6 sixth 4.7 seventh 5.5 eighth 7.1 ninth 8.0 tenth 10.5 eleventh 14.7 twelfth 19.2 reverse 1.8, 2.4, 7.5, 9.7 **Clutch** single plate dry disc operated by foot pedal **Brakes** dry double disc operated by two foot pedals which can be locked together **Steering** mechanical with power assist **Turning radius** (on concrete surface with brake applied) right 117.25″ left 113.5″ (on concrete surface without brake) right 120.75″ left 124.75″ **Turning space diameter** (on concrete surface with brake applied) right 242″ left 234″ (on concrete surface without brake) right 248″ left 256″ **Power take-off** 540 rpm at 1683 rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test code or official Nebraska test procedure. Temperature at injection pump return was 162°F. Six gears were chosen between tangential pull limit of driving tires and 15 mph.

We, the undersigned, certify that this is a true and correct report of official Tractor Test **1193.**

LOUIS I. LEVITICUS
Engineer-in-Charge

G. W. STEINBRUEGGE, Chairman
W. E. SPLINTER
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Board of Tractor Test Engineers

The Agricultural Experiment Station
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
H. W. Ottoson, Director

EXPLANATION OF TEST REPORT

GENERAL CONDITIONS

Each tractor is a production model equipped for common usage. Power consuming accessories may be disconnected only when the means for disconnecting can be reached from the operator station. Additional weight can be added as ballast if the manufacturer regularly supplies it for sale. The static tire loads and the inflation pressures must conform to recommendations in the Tire Standards published by the Society of Automotive Engineers.

PREPARATION FOR PERFORMANCE RUNS

The engine crankcase is drained and refilled with a measured amount of new oil conforming to specifications in the operators manual. The fuel used and the maintenance operations must also conform to the published information delivered with the tractor. The tractor is then limbered-up for 12 hours on drawbar work in accordance with the manufacturer's published recommendations. The manufacturer's representative is present to make appropriate decisions regarding mechanical adjustments.

The tractor is equipped with approximately the amount of added ballast that is used during maximum drawbar tests. Prior to the maximum power run the tire tread-bar height must be at least 65% of new tread height.

POWER TAKE-OFF PERFORMANCE

Maximum Power and Fuel Consumption. The manufacturer's representative makes carburetor, fuel pump, ignition and governor control settings which remain unchanged throughout all subsequent runs. The governor and the manually operated governor control lever is set to provide the high-idle speed specified by the manufacturer for maximum power. Maximum power is measured by connecting the power take-off to a dynamometer. The dynamometer load is then gradually increased until the engine is operating at the rated speed specified by the manufacturer for maximum power. The corresponding fuel consumption is measured.

Varying Power and Fuel Consumption. Six different horsepower levels are used to show corresponding fuel consumption rates and how the governor causes the engine to react to the following changes in dynamometer load: 85% of the dynamometer torque at maximum power; minimum dynamometer torque, ½ of the 85% torque; maximum power, ¼ and ¾ of the 85% torque. Since a tractor is generally subjected to varying loads the average of the results in this test serve well for predicting the fuel consumption of a tractor in general use.

DRAWBAR PERFORMANCE

All engine adjustments are the same as those used in the belt or power take-off tests.

Varying Power and Fuel Consumption With Ballast. The varying power runs are made to show the effects of speed-control devices (engine, governor, automatic transmission, etc.) on horsepower, speed and fuel consumption. These runs are made around the entire test course which has two 180 degree turns with a minimum radius of 50 feet. The drawbar pull is set at 4 different runs as follows: (1) as near to the pull at maximum power as possible and still have the tractor maintain the travel speed at maximum horsepower on the straight sections of the test course; (2) 75% of the pull at maximum power; (3) 50% of the pull at maximum power; and (4) maintaining the same load and travel speed as in (3) by shifting to a higher gear and reducing the engine rpm.

Maximum Power with Ballast. Maximum power is measured on straight level sections of the test course. Data are shown for not more than 6 different gears or travel speeds. Some gears or travel speeds may be omitted because of high slippage of the traction members or because the travel speed may exceed the safe limit for the test course. The manufacturer's representative has the option of selecting one gear or speed over eight miles per hour. The maximum safe speed for the Nebraska Test Course has been set at 15 mph. The slip limits have been set at 15% and 7% for pneumatic tires and steel tracks or lugs, respectively. Higher slippage gives widely varying results.

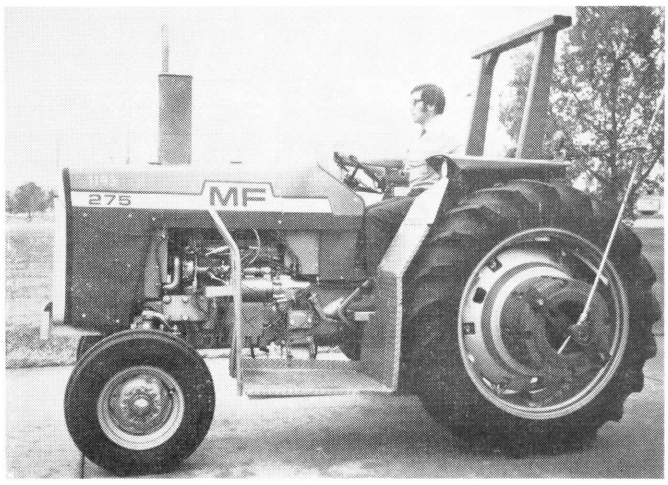
Varying Drawbar Pull and Travel Speed with Ballast. Travel speeds corresponding to drawbar pulls beyond the maximum power range are obtained to show the "lugging ability" of the tractor. The run starts with the pull at maximum power; then additional drawbar pull is applied to cause decreasing speeds. The run is ended by one of three conditions: (1) maximum pull is obtained, (2) the maximum slippage limit is reached, or (3) some other operating limit is reached.

SOUND MEASUREMENT

Sound is recorded during each of the Varying Power and Fuel Consumption runs as the tractor travels on a straight section of the test course. The dB(A) sound level is obtained with the microphone located near the right ear of the operator. Bystander sound readings are taken with the microphone placed 25 feet from the line of travel of the tractor.

An increase of 10 dB(A) will approximately double the loudness to the human ear.

For additional information about the **Nebraska Tractor Tests** write to the **Department of Agricultural Engineering, University of Nebraska, Lincoln, Nebraska** 68583.



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